

# PIECEWISE INTRO 1

Let us look at an application of a piecewise function. Lisa makes \$4/hr baby-sitting before midnight and \$6/hr after midnight. She begins her job at 7 PM.



- a. Complete the table below for the total amount of money Lisa makes.

Time	8PM	9PM	10PM	11:30	12:00	12:30AM	1AM	2AM
Hours Sitting		2	3		5		6	7
Amount Earned	\$4							

- b. If we want to fill out the entries after midnight in the table above, we need to realize that the function is piecewise; that is, Lisa is paid at two different rates, one for the time she baby-sits before midnight, and another for the time she baby-sits after midnight. Since the rate changes at  $t = 5$ , we need two different rules: one for  $t \leq 5$  and one for  $t > 5$ . Find the two different functions that would define how much money Lisa makes with respect to the number of hours she baby-sits. Express the function as a piecewise function using the notation shown in the previous problem. Use the notation shown below to get started.

$$f(t) = \begin{cases} \dots & \text{for } 0 \leq t \leq 5 \\ \dots & \text{for } t > 5 \end{cases}$$

# Piecewise intro 2

Here is another piecewise function

$$f(x) = \begin{cases} x^2 + 2 & \text{for } x \leq 1 \\ 2x + 7 & \text{for } x > 1 \end{cases}$$

- a. Fill out the table for  $y$  below.

For $x \leq 1$	
$x$	$y = x^2 + 2$
-5	
-4	
-3	
-2	
-1	
0	
1	

For $x > 1$	
$x$	$y = 2x + 7$
1	
2	
3	
4	
5	
6	
7	

- b. Using your table, make a careful sketch of the graph  $y = f(x)$ . Recall the use of open circles to indicate that an end point *is not* included and closed circles to indicate that an end point *is* included. At which points will the open and closed circles be located on this graph?
- c. What are the domain and the range of this function?